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ARTICLE III.

A SYNOPSIS OF THE SPECIES OF THE TEIID GENUS CNEMIDOPHORUS.

BY E. D. COPE.

Read before the American Philosophical Society, January 1, 1892.

CNEMIDOPHORUS Wagler.

Natur. Syst. Amphib., 1830, p. 154 partim; Wiegmann, Herp. Mexic., 1834, 9; Dum. Bibr., Erp. Gen., V, 1839, 123; Gray, Catal. Liz. Brit. Mus., 1 Ed., 1845, 20; Boulenger, 2 Ed., II, 1885, 360.

Scaly portion of tongue cordate behind, and non-retractile. Tail rounded. Teeth longitudinally compressed. Head large, regular; ventrals large; frontoparietals and parietals distinct. A collar-fold and femoral pores.

This genus embraces many species of the Neotropical realm, exclusive of the West Indian region, where it is replaced by *Amiva*.* Five species enter the Nearctic realm, and all but one of these are restricted to the Sonoran region. The *C. sexlineatus* Linn. ranges the entire Nearctic excepting the Hudsonian and Alleghenian districts, and the northern parts of the Central and Californian. The following are the characters of the species:

I. Nostril between the nasal plates. Males with a spine on each side the preanal region.

A. 10-12 longitudinal rows of ventral plates.

Brachial shields small, no post-antebrachials; 5 parietals; 4 supraoculars; femoral pores 29-35; olive, white-spotted..... *C. murinus*.

AA. Ventral plates in 8 longitudinal rows.

Large brachials; no post-antebrachials; 5 parietals; 4 supraoculars; femoral pores 19; olive above with a lighter dark-edged dorsal band..... *C. esepetitii*.

Large brachials; no post-antebrachials; 5 parietals; 4 supraorbitals; femoral pores 18-24; olive with 5-9 light longitudinal stripes *C. lemniscatus*.

Brachials very small; black or blackish-brown with lines on the nape and spots on the outer side of the limbs *C. nigricolor*.

* Dr. Steindachner describes (Annalen des K. K. Natur. Hofmus., Wien, 1891, p. 374) three species as *Cnemidophorus centropyx*, *tumbesanus* and *peruanus*, with large keeled dorsal scales. The last two have but one frontoparietal plate as in *Dicrodon* and *Verticaria*, and all three have the other external characters of those genera. The characters of the teeth are not mentioned.

II. Nostril anterior to nasal suture.

1. Ventral plates in 10-12 longitudinal rows.

Dorsal scales granular; edge of collar granular; brachials large; no post-antibrachials; femoral pores 10-12; 3 parietals; 3-4 supraorbitals; olive with rows of black spots, and 1 or 2 white lines on each side..... *C. lacertoides*.

Dorsal scales coarse, flat; scales of collar very small; parietals 3; supraoculars 4; brachials large; olive with nine longitudinal lines above..... *C. longicaudus*.

2. Ventral plates in 8 longitudinal rows.

A. Scales of collar not larger at edge, which is more or less granular; supraorbitals 3 (parietals 3; no post-antibrachials).

Hind leg shorter, reaching meatus auditorius; anal scales continuous with abdominals; femoral scales in 6-7 rows; brachials larger; anals 10-12; usually five stripes on each side,

C. deppei.

Hind leg longer, reaching nasal suture; minute scales between abdominals and anals; femoral scales in 10-12 rows; brachials smaller; anals 10-12; only four stripes on each side,

C. guttatus.

AA. Scales of collar not larger at edge, which is more or less granular; supraorbitals 4 (parietals 3).

α. Prenasal not reaching second superior labial.

β. Post-antibrachial plates wanting.

Large; anal plates 10 or more; brachials in 4-5 rows; femoral pores 24-5; hind leg extended reaches ear; stripes broad and irregular..... *C. maximus*.

Medium; anal plates 5-6; brachials in 4-8 rows; femorals in 6-9; femoral pores 19-21; scales generally coarse; the hind leg extended reaches ear; stripes complete or broken up,

C. tessellatus.

Smaller; anal plates 8-10; brachials 6 rows; femorals 8; femoral pores 25; hind leg extended reaches prenasal plate; yellow spotted on olive ground..... *C. variolosus*.

Small; brachial plates 5 rows; femorals 6; femoral pores 17; scales smooth; striped; hind leg to ear..... *C. octolineatus*.

Small; brachial rows 6; femorals 4-5; femoral pores 17; scales rough; unicolor; hind leg to ear..... *C. inornatus*.

AAA. Collar with large scales, the largest at the edge.

α. Anterior nasal plate not reaching second superior labial.

β. Femoral pores 15 or more.

γγ. No post-antibrachial plates.

Small; stripes persistent, no intermediate spots; femur with a stripe behind; femoral pores 15-17; head short, loreal plate higher than long; femoral scales 7-8 rows; 5 infralabials,

C. sexlineatus.

Large; stripes more or less connected with spots which cut up the dark ground into spots and crossbars posteriorly; femur without stripe behind; femoral pores 20-21; loreal plate longer than high; femoral scales 7-8 rows..... *C. grahamii*.

γγ. Post-antibrachial scales present.

Median gular scales smaller than those of collar; femoral pores 16-18; femoral scales in 8 rows; infralabials 6; 7 undulate black stripes on an olivaceous ground..... *C. septemvittatus*.

Median gular scales smaller than those of collar; femoral pores 18-23; muzzle elongate, loreal longer than high; dark bands interrupted by larger or smaller light spots or intervals,

C. gularis.

ββ. Femoral pores fewer than 15.

Femoral pores 12; 3 parietals; 3 supraorbitals; gray brown with 10 longitudinal stripes,

C. multilineatus.

Femoral pores 9-11; 5 parietals; 4 supraoculars; anals forming a triangle; olive brown with 6 stripes or some rows of spots.....*C. ocellifer.*

αα. Anterior nasal plate reaching second labial.

Femoral pores 13; one marginal anal plate; 6 white stripes; small.....*C. labialis.*

In this genus as in others, some characters which are constant in one species are inconstant in another. The presence or absence of the sixth infralabial, and of the frenoörbital plates, are of this nature. The number of femoral pores varies within a small range in all of the forms. Anomalies in the division of the head plates are rare, but sometimes occur in this genus. Such are the fusion of the symphyseal and postsymphyseal plates, the presence of an additional labial plate, etc.

The discrimination of the North American species of this genus is the most difficult problem in our herpetology. Nowhere are subspecies more clearly defined than in *Cnemidophorus*, *i. e.*, definable geographical forms, which are not always true to their characters.

The color markings differ in the same individual at different ages, and the age at which the adult coloration is assumed differs in different localities. Some of the species, *e. g.*, *Cnemidophorus sexlineatus*, never abandon the coloration of the young of other species and subspecies. The same condition is characteristic of the *C. deppei* of Mexico, the *C. lemniscatus* of Brazil, and other species. The process of color modification is, as I have pointed out,* as follows: The young are longitudinally striped with from two to four stripes on each side of the middle line. With increasing age, light spots appear between the stripes in the dark interspaces. In a later stage these spots increase in transverse diameter, breaking up the dark bands into spots. In some of the forms these dark spots extend themselves transversely and unite with each other forming black cross-stripes of greater or less length. Thus we have before us the process by which a longitudinally striped coloration is transformed into a transversely striped one.

The large number of specimens of the *C. tessellatus* and *C. gularis* in the National Museum collection show that the breaking up of the striped coloration appears first at the posterior part of the dorsal region (*i. e.*, the sacral and lumbar). The confluence of the spots appears there first; and finally (*C. gularis semifasciatus*), where the color markings disappear, leaving a uniform hue, this also appears first at the posterior part of the body. In the *C. tessellatus rubidus* the dark spots disappear first on the anterior regions.

* Proceeds. Amer. Philos. Soc., 1885, p. 283.

The species of *Cnemidophorus* inhabit dry open ground where they can observe their insect prey, and watch their enemies. From the latter they escape by the extreme rapidity of their movements, which renders it difficult to follow them with the eye, to which they appear as a streak flying over the ground. For this reason they are popularly known as "swifts." They are nevertheless frequently caught and eaten by snakes.

CNEMIDOPHORUS MURINUS Laur.

Gray, Catal. B. M., p. 21 ; Dum. Bibr., Erp. Gen., V, 126 ; Bocourt, Miss. Sci. Mex. Rept., Pl. XX, Fig. 1 ; Boulenger, Catal. Liz. B. M., III, 361, *Leps murinus* Laurenti.
Guiana, Curaçoa, Trinidad.

CNEMIDOPHORUS ESPEUTII Boulenger.

Catal. Liz. B. M., III, 362, Pl. XIX.
Old Providence Id. ; Swan Id. ; both off the east coast of Central America.

CNEMIDOPHORUS LEMNISCATUS Daudin.

Gray, Catal. Liz. B. M., 21 ; Dum. Bibr., Erp. Gen., V, 128 ; Bocourt, Miss. Sci. Mex. Rept., Pl. XXc, Fig. 2 ; Boulenger, Catal. Liz. B. M., III, 363.
Tropical South America east of the Andes.

CNEMIDOPHORUS NIGRICOLOR Peters.

Sitzber. Gess. Nat. Fr. Berlin, 1873, 76 ; Bocourt, Miss. Sci. Mex., Pl. XXc, Fig. 3 ; Boulenger, Catal. Liz. B. M., 364.
Los Roques Ids. off La Guayra, New Granada. (Known only to me by descriptions.)

CNEMIDOPHORUS LACERTOIDES Dum. Bibr.

Erp. Gen., V, 134 ; Bocourt, Miss. Sci. Mex. Rept., XXc, Fig. 10 ; Boulenger, Catal. B. M., III, 373.
Southern Brazil, Uruguay, Argentine.

CNEMIDOPHORUS LONGICAUDUS Bell.

Gray, Catal. Liz. Brit. Mus., 21 ; Bocourt, Miss. Sci. Mex. Rept., Pl. XXc, Fig. 13 ; Boulenger, Catal. Liz. Brit. Mus., III, 374.
Amiva longicauda Bell, Zool. Beagle Rept., 28, Pl. XV, Fig. 1.
Northern Patagonia.

CNEMIDOPHORUS DEPPEI Wiegmann.

Herpet. Mexicana, 1834, p. 28 ; Bocourt, Miss. Sci. Mex. Rept., p. 281, Pl. XX, Fig. 3 ; Boulenger, Catal. Liz. B. M., 1885, 371.

There are three well-marked subspecies of the *C. deppei*, which differ in their coloration, and in the number of their femoral pores, and which have distinct geographical ranges. They are defined as follows :

Four with or without a median, or five narrow stripes on each side ; sides green, unspotted ; belly yellowish to black ; hind legs with large spots ; femoral pores 17-19. *C. d. deppei*.

- Five lateral and a vertebral stripe ; the lowest lateral a row of yellow spots on a green ground ; belly black ; legs scarcely yellow spotted ; femoral pores 21-23 *C. d. decemlineatus*.
 Five lateral and a vertebral stripe ; the lowest wide, and on the black sides, which have yellow spots below the stripe, often defining vertical black bars ; belly yellowish ; legs little spotted ; femoral pores 14-16. *C. d. lineatissimus*.

Cnemidophorus deppei deppei Wiegman.

L. c. Bocourt, *l. c.* *C. lativittis* Cope, Proceeds. Amer. Philos. Soc., 1877, p. 94.

One specimen from Guatemala, *Van Patten*, and two from Tehuantepec, *Sumichrast*.

Cnemidophorus deppei decemlineatus Hallowell.

Cnemidophorus decemlineatus Hallowell, Proceeds. Academy Phila., 1860, 482.

Three specimens from Central America and twelve from Nicaragua, *C. Wright*.

The largest form, and distinguished by its color and numerous femoral pores.

Cnemidophorus deppei lineatissimus Cope.

Cnemidophorus lineatissimus Cope, Proceeds. Amer. Philos. Soc., 1877, 94.

Sixteen specimens from Colima, Mex., *Xantus*, and four from Guadalajara, *Major*.

This form is the most distinct in color characters, which are perfectly constant, and it is further characterized by the small number of femoral pores. It would rank as a species if compared with *C. d. decemlineatus* only, varying from the type in the opposite direction from that form.

CNEMIDOPHORUS GUTTATUS Wiegman.

Herp. Mexicana, 1834, 29 ; Bocourt, *Miss. Sci. Mex. Rept.*, 285, Pl. XXc, Fig. 4 ; Boulenger, *Catal. Liz. Brit. Mus.*, 1885, II, 370.

This species presents several forms which may be regarded as subspecies until their constancy can be proven. They differ as follows :

- I. Brachial and postbrachial plates continuous ; few or no granules on the edge of the collar.
 Four light stripes on each side ; large. *C. g. immutabilis*.
- II. Brachial and postbrachial plates separated by smaller scales ; numerous granules on edge of collar.
 Four light stripes on each side ; small ; back not spotted *C. g. microlepidopus*.
 Two light stripes on each side ; the back light spotted ; large. *C. g. guttatus*.
 Unicolor ; small. *C. g. unicolor*.

Cnemidophorus guttatus immutabilis Cope.

Cnemidophorus immutabilis Cope, Proceeds. Amer. Philos. Soc., 1877, 93.

This form might be regarded as a species but for the fact that its characters are not entirely trustworthy. Thus one of the specimens has a few granules at the mid-

dle of the edge of the collar, and there are a few smaller scales between the large brachial and postbrachial scales.

Two specimens from Tehuantepec, *Sumichrast*, the larger equal in size to the *Amiva surinamensis*.

Cnemidophorus guttatus microlepidopus Cope.

Cnemidophorus microlepidopus Cope, Proceeds. Amer. Philos. Soc., 1877, p. 370.

This form differs from the typical *guttatus* in color only, and may be the young. The median dorsal region is, however, unspotted.

One specimen, Tehuantepec, *Sumichrast*.

Cnemidophorus guttatus unicolor Cope.

Cnemidophorus unicolor Cope, Proceeds. Amer. Philos. Soc., 1877, p. 93.

The form is represented by one of the smallest specimens. According to the rule which prevails in this genus, it should be striped if merely the young of the *C. g. guttatus*. The absence of stripes then indicates probably a race different from the typical form of the species.

One specimen from Tehuantepec, *Sumichrast*.

Cnemidophorus guttatus guttatus Wiegman.

Cnemidophorus guttatus Wiegman, l. c.; Bocourt, l. c.; Boulenger, l. c.

Amiva guttata Cope, Proceeds. Acad. Phila., 1863, p. 63.

Three specimens from Jalapa, *Pease*, in the Museum of the Philadelphia Academy.

The above specimens are of relatively large size, equaling the *C. g. immutabilis*.

CNEMIDOPHORUS MAXIMUS Cope.

Proceeds. Academy Phila., 1863, p. 104.

The largest species of the genus, equaling many of the *Amivas* in dimensions. It inhabits the peninsula of Lower California.

This species varies in the number of its anal plates, some specimens having fewer than others. The brachial plates also vary in number from six to eight rows. Two young specimens (No. 12,658) in which the umbilical fissure is still open, are about as large as the adult *C. sexlineatus*. They have a median dorsal light stripe, and two on each side on a blackish ground. Each of the two dark bands thus produced is marked by two rows of pale spots. In this they differ from the spotted

striped form of the *C. tessellatus* and *C. sexlineatus*, which have but one series of such spots. The femur and tibia are crossbarred, and the former is not marked with a longitudinal stripe behind.

CNEMIDOPHORUS TESSELLATUS Say.

Baird, U. S. Pac. R. R. Surveys, Vol. X, 1859, Gunnison's Report, p. 18.

Cope, Check List Batr. Rept. N. Amer., 1875, 46.

Amia tessellata Say, in Longs. Exped. Rocky Mts., 1823, II, p. 50.

Scales of the back and sides generally coarse, .05 mm. in diameter. Scales of the collar not larger than those of the throat, the edge of the collar with smaller often granular scales. Four supraorbital scales, the posterior smaller than the others. These are separated from both the superciliaries and the frontal and frontoparietal by granular scales whose extension anteriorly differs in different individuals. Frontoparietals as large as the parietals, truncate in front. Interparietal longer than broad, longer than each parietal. The latter undivided. A transverse series of small plates bound the parietals and interparietals posteriorly. Frenal plate longer than postnasal. One row of scuta in front of orbit, and below orbit, separating the latter from the superior labials. Superior labials five to below middle of orbit, the fifth acuminate posteriorly. Infralabials five.

Brachial scales in four to eight longitudinal rows (rarely five) counted at the middle, continuous with antebrachials, which are in three rows (rarely two). Post-antebrachials small, uniform. Femoral plates in seven to nine rows (counted at middle and to the line of pores) and tibial plates in three longitudinal rows. Femoral pores varying from nineteen to twenty-one in number.

Color varying from olivaceous black to olivaceous brown, which is marked by light yellow or orange longitudinal stripes or spots on the dark ground, or reversed by black spots on a light ground. The head is unspotted and unstriped, except occasional maculations of the gular region. Belly from yellowish to black or spotted. Limbs crossbarred or spotted, and not distinctly striped posteriorly.

The size varies from a length of head and body of 86 m. to 102 mm. In the former the total length is 260 mm.; in the latter, 350 mm. For more detailed measurements see under the respective subspecies.

This species ranges over the Sonoran and Lower Californian regions and the Pacific, nearly to the northern boundary of California. Its distribution is somewhat coincident with that of the *Eutenia elegans* (omitting the Rocky mountains proper), and its eastern border is overlapped by the range of the eastern *C. sexlineatus*. The

range of variations of color seen in the *C. tessellatus* is about the same as that seen in the *C. gularis*, although, with a few exceptions, the subspecies of the two may be distinguished from each other by color characteristics, without examining the scale characters. The parallelism is, however, very close, and shows the same line of modifications. I refer more especially to these under the head of *C. gularis*.

The subspecies of the *C. tessellatus* are five, as follows :

I. Brachial scales 4-5 rows ; femorals 6-7 rows.

Blackish olive above with a median dorsal paler stripe, and three similar stripes on each side ; belly and throat unspotted *C. t. perplexus*.

Two pale stripes on each side only, the interspaces pale spotted, and frequently broken up into black or olive spots so as to destroy their integrity ; generally sparsely black spotted below, *C. t. tessellatus*.

No stripes, but 12-14 longitudinal series of pale spots on an olivaceous ground, more or less confluent ; hind legs with numerous pale spots ; thorax, collar, and more or less of throat, black *C. t. melanostethus*.

II. Brachial scales in 5-6 rows ; femorals 8-9 rows.

No stripes ; ground color dove brown, with 3 rows of more or less obsolete black spots on the back, and vertical black bars on the sides ; abdominal plates pale, black edged ; hands and inferior faces of hind legs and tail red ; larger *C. t. rubidus*.

III. Brachial scales 7-8 rows ; femorals in 8-9 rows.

Four light stripes above, interrupted and connected with light spots and lines in the black interspaces, sides, throat and inferior surfaces variegated black and white ; medium, *C. t. multiscutatus*.

Cnemidophorus tessellatus perplexus Bd. Gird.

Cnemidophorus perplexus Bd. Gird., Proceeds. Acad. Phila., 1852, p. 128.

Cope, Check List Batr. Rept. N. Amer., 1875, p. 46.

The type specimen is the largest obtained, and is probably adult. Its colors are rather obsolete, while those of three younger specimens are as strongly contrasted as in the young of any other form. Among all the striped forms of the *C. tessellatus*, this one is distinguished by the presence of seven stripes and no spots. It is, so far as yet known, confined to the valley of the Rio Grande river.

Cnemidophorus tessellatus tessellatus Say.

Cnemidophorus tessellatus Baird, l. sup. cit. ; Cope, l. sup. cit. ; *Amiva tessellata* Say, l. sup. cit.

Cnemidophorus gracilis Bd. Gird., Proceeds. Acad. Phila., 1852, 128 ; Baird, U. S. Mex. Bound. Surv., Report II, Pt. II, Rept., p. 10, Pl. XXXIV, Figs. 7-14.

Cnemidophorus marmoratus B. & G., Proceeds. Acad. Phila., 1852, p. 128.

Cnemidophorus tigris Bd. Gird., Proceeds. Acad. Phila., VI, 1852 (April), 69 ; Baird, U. S. Mex. Bound. Surv. Rept., 1859, II, Pt. II, Reptiles, p. 10, Pl. XXXIII.

Cnemidophorus tessellatus tigris Cope, Check List Batr. Rept. N. Amer., 1875, p. 46.

Cnemidophorus undulatus Hallow., Proc. Acad. Phila., VII, 1854, June, p. 94

The adult differs from the young in color, and its colors may be best understood by reference to the latter. In this stage the ground color of the back and sides is black or blackish olive, and it is transversed by two light yellowish stripes on each side. One of these starts at the occipital plate, and the other at the superciliary angle. The lateral stripe which extends from above the auricular meatus in the *C. t. perplexus* is here wanting. There is sometimes a trace of a median dorsal stripe, but generally not. Faint longitudinal lines are sometimes present between the stripes mentioned. On the sides below the external stripe are three series of more or less longitudinal spots, which outline three stripes; but they are not connected, excepting sometimes in the transverse direction. This stage represents the *C. gracilis* B. & G.

In mature specimens rounded spots appear between the longitudinal stripes, and the lateral spots become connected transversely so as to leave the dark ground color in the form of irregular transverse bars (Nos. 3047, 4970 and 15,619). In some specimens the median dorsal stripe is distinct, and is even divided into two (No. 11,978). Such specimens have six stripes very close together, but only the external pair on each side are homologues of those of the *C. sexlineatus* and *C. gularis*. In the majority of adult specimens the light spots expand transversely and produce an emargination on one side or the other of the black ground, or cut it into sections or spots, by expanding in both directions. In the former case the dark stripes become irregular or undulate in outline. This is the usual condition on the anterior part of the body. On the posterior part of the body the dark ground is usually broken into spots. In the type specimen of the *C. tigris* B. & G. the breaking up of the black intervals had not been completed, although the specimen is of full size. In typical specimens this part of the body is marked by three longitudinal rows of transverse black spots. The upper surface of the tail is generally marked with brown spots, sometimes rather large, but in other specimens confined to the keels of the scales. In some they are wanting.

In the last modification the traces of stripes have almost or quite disappeared. The upper pair are first to be interrupted by transverse and oblique extensions of the irregularly shaped black spots, and the inferior stripes are finally interrupted and lost in the same manner. Thus in Nos. 8633 and 3043a, the spots are transversely confluent in every direction, bearing only irregular areas of the white color, now become the ground. These approach nearest to the *C. variolosus* m., and represent the *C. marmoratus* of Baird and Girard. In the type of that supposed species a trace of the inferior stripe remains on each side. The end of the fourth toe of the extended posterior foot reaches the *meatus auditorius*, and there are twenty femoral

pores on each side. The length of the head and body is 85 mm.; in No. 8633 it is 100 mm.

Hallowell, in describing this subspecies as *C. undulatus*, recognized the difference between it and the *C. t. perplexus*, remarking that the present form has but two light stripes on each side.

This form ranges the Sonoran and Lower Californian regions to Utah, inclusive, and extends to the northern part of California.

Cnemidophorus tessellatus melanostethus Cope.

Check List Batr. Rept. N. Amer., 1875, p. 46.

Cnemidophorus melanostethus Cope, Proceeds. Acad. Phila., 1863, p. 104.

The coloration of this subspecies is something like that of the *C. variolosus*, but that is another species. The interparietal plate is narrower than in the *C. t. tessellatus*, and the black breast and gular region are not seen in it.

A number of young specimens accompany the two adults described. They have two narrow stripes on each side of the middle line, and the spaces between them contain each a row of pale spots. The thorax is not black. These resemble the young of *C. t. tessellatus* (*C. gracilis*), but the latter has brighter colors, and where the spaces between the stripes contain marks there are delicate longitudinal lines (No. 3034, type of *C. gracilis*).

This form is only known from the Colorado river of Arizona.

A form very much like this subspecies has been named *C. martyris* by Stejneger.* The two known specimens differ from the *C. t. melanostethus* in their smaller size and in the extension of the black over the entire inferior surface. It is doubtful whether it can be regarded as a subspecies. It is from the Island of San Martir, Gulf of California.

Cnemidophorus tessellatus rubidus Cope.

This elegant form is represented in the National collection by seven individuals, of which three are adult. To the usual characters of the species it adds some others. Thus the scales are rather finer, being less than .5 mm. in diameter. The femoral scales are more numerous. Femoral pores twenty-two. Small scales of collar border not granular.

There are three parietals, and the longest toe reaches the auricular meatus. There are the usual three anals, with one in front of the median, which is, with the latter, bounded by a few scales on the sides. Median gular scales rather coarse.

* Proceeds. U. S. Nat. Museum, XIV, 1890, p. 407.

Loreal longer than high. Small scales above anterior canthus of eye numerous and rather prominent. The keels of the caudal scales are prominent, and except at the base of the tail, in continuous lines.

The color of the upper surfaces in the adult is a dove brown. This is marked on the back by three series of transverse black spots, which are well separated from each other. In one specimen the spots are very narrow; in another they are nearly obsolete on the anterior part of the back. On the sides similar black spots are more or less confluent into vertical black stripes. The head and fore legs are uniform brown above; the hind limbs have on a similar ground narrow blackish crossbars, sometimes indistinct. Tail pale brown above with olive and brown spots. Inferior surfaces straw colored tinged with green, and varied with black and red. The abdominal scuta are black bordered, and the throat is black spotted, sometimes strongly, sometimes faintly. The palms and sometimes the entire inferior surface of the anus is a bright vermilion. Posterior and inferior sides of femora, inferior aspect of tibia, and inferior side and distal half of tail bright vermilion.

The young specimens have traces of six longitudinal stripes of an olivaceous or light brown color, and the spaces between them are crossbarred with black and olive, as in the *C. gularis mariarum*, which this form closely resembles at this stage. The black spots become more distinct with age, and the interspaces blend completely with the stripes, so that the latter are ultimately completely lost in a common ground color. The femora are reticulated with black on an orange ground above. The black and red of the inferior surfaces are not so pronounced as in the adult.

Measurements.

	<i>M.</i>
Total length.....	.340
Length to posterior edge of ear.....	.024
Length to collar034
Length to vent.....	.100
Length of fore limb.....	.035
Length of hind limb.....	.072
Length of hind foot.....	.036

Cnemidophorus tessellatus rubidus Cope.

<i>Catalogue Number.</i>	<i>Number Specimens.</i>	<i>Locality.</i>	<i>Whence obtained.</i>
15,149	1	St. Margareta Id., Lower California.	U. S. Fish Commission Steamer <i>Albatross</i> .
50	1		
1	1		
2	1		
3	1		
4	1		
5	1		

Cnemidophorus tessellatus multiscutatus Cope.

Cnemidophorus tessellatus tigris B. & G., Cope, Proceeds. U. S. Nat. Museum, 1889, p. 147; not of Baird and Girard.

Represented in the U. S. National Museum by four specimens of medium size. The muzzle is rather acute, and moderately elongate. The extended hind leg reaches to the orbit. In two larger specimens there are six plates of the infralabial row, and in two smaller but five. Four large anals, two on the middle line in front of the marginal pair. These four are surrounded by a series of smaller plates as far as the vent. Scales of the tail with the keels slightly oblique throughout. The peculiarity of the subspecies is seen in the large number of rows of brachial scales (7-8 rows), and femoral scales (8-9 rows). The former are not quite constant, however, one of the smaller specimens having but six rows. Femoral pores 20-22. The scales are smaller than is usual in *C. tessellatus*, measuring .33 and .25 mm. in diameter.

The color is generally of the *C. tessellatus tessellatus* type, but the black ground color is more persistent. The light stripes are most broken up posteriorly, and the communicating pale cross-spots are widest and most numerous. On the sides the pale spots are of irregular shapes, being both longitudinal and transverse on a black ground. Belly black and light olive in varying proportions. Gular region and collar with transverse black spots or bands. Fore limbs black with light olive spots; hind limbs brown with blackish reticulation. Tail brown above, black-spotted below.

	<i>Measurements.</i>	<i>M.</i>
Total length.....		.275
Length to meatus auditorius.....		.021
Length to collar.....		.030
Length to vent.....		.085
Length of fore limb.....		.032
Length of hind limb.....		.065
Length of hind foot.....		.035

Cnemidophorus tessellatus multiscutatus Cope.

<i>Catalogue Number.</i>	<i>Number Specimens.</i>	<i>Locality.</i>	<i>Whence derived.</i>
15,160	1	} Cerros Island, west coast of Lower California.	U. S. Fish Commission Steamer <i>Albatross</i> .
1	1		
2	1		
3	1		

CNEMIDOPHORUS VARIOLOSUS Cope.

This species exhibits the general scale characters of the *C. tessellatus*, but possesses some peculiarities. The interparietal plate is twice as large as either parietal. Infralabials five. The scales of the brachium and of the femur are smaller and more numerous than in the *C. tessellatus*. There are six rows of the former, four being the usual number in the latter species; and eight of the latter, six or seven being the usual number. Brachial rows three; tibials three. Anal scuta with the lateral scales rather larger than usual, giving four large and six small ones in all. Femoral pores more numerous, twenty-five on each side. This species is especially characterized by the length of the hind leg, which reaches, when extended, to the postnasal plate, instead of to the *meatus auditorius* only. The scales of the mesopterygium extend all the way across, and are not interrupted at the middle by smaller ones as in the *C. t. perplexus*. The marginal scales are smaller. Posterior gular scales are smaller, bounded in front by the larger scales of the anterior gular region.

Total length 250 mm.; of head and body to vent 65 mm.; of head to angle of mandible 10 mm.; to collar 24 mm.; to axilla 31 mm.; length of fore leg 27 mm.; of fore foot 12 mm.; of hind leg 55 mm.; of hind foot 30 mm.

The typical specimen is of a size which would be fully striped if it belonged to the *C. maximus* or *C. tessellatus*, being that of the eastern *C. sexlineatus*. There are, however, no stripes, but the olivaceous ground of the superior surfaces is marked with numerous rather small yellowish oval spots. Those of the sides are irregularly disposed, but those of the superior surfaces are arranged in six more or less irregular series. Of these the two external on each side correspond with the two external stripes of the young of the *C. tessellatus*. On the nape the series lose their regularity, and on the nape region they are more frequently transverse. The hind legs are olivaceous, marked with numerous irregular oval yellow spots. No stripe on the posterior face of the femur. Head without spots or stripes. Gular region dark olive; thorax blackish; belly yellowish, the scales with black bases. Tail olive with scales above yellowish at the base, brownish beyond; below brown except the basal fourth, which is yellowish with black spots on most of the scales. Posterior limbs with oval yellowish spots on an olivaceous ground. Femur not striped behind.

This species resembles the *C. maximus* in the increased number of its femoral pores and femoral and brachial scales, but is distinguished by its much longer hind leg, spotted coloration and much smaller size.

Cnemidophorus variolosus Cope.

<i>Catalogue Number.</i>	<i>Number Specimens.</i>	<i>Locality.</i>	<i>Where obtained.</i>	<i>Nature of Specimen.</i>
3066	1	Parras Coahuila.	Lieut. Couch, U.S.A.	Alcoholic.

CNEMIDOPHORUS OCTOLINEATUS Baird.

Proceeds. Academy Phila., 1858, p. 255.

U. S. Mexic. Boundary Survey, II, 1859, Pt. II, Reptiles, p. 10.

Cope, Check List Batr. Rept. N. Amer., 1875, p. 45.

This species differs from the young specimens of the *C. tessellatus* of equal size, in the small number of its femoral pores, and in the absence of spots on the hind limbs and sides, as well as in the additional pair of median longitudinal stripes. The single known specimen is apparently adult, and is about equal in size to a half-grown *C. tessellatus*, and smaller than the *C. variolosus*.

CNEMIDOPHORUS INORNATUS Baird.

Proceeds. Acad. Phila., 1858 (Dec.), 255.

Rept. U. S. Mex. Bound. Survey, II, 1859, Pt. II, Rept., p. 10.

Cope, Check List Batr. Rept. N. Amer., 1875, p. 45.

This species is distinguished by a combination of characters. The rough scales are peculiar to it, and it is the only species known to me in which the rows of brachial plates exceed the femoral in number. It is the smallest species, and yet shows no indication of stripes.

CNEMIDOPHORUS SEPTEMVITTATUS Cope.

Scales of collar large, in three transverse rows, the largest row on the edge; scales of mesoptychium small, flat, those of gular region longer. Head narrower than in any other species, the first and second supraorbital plates longer than wide, the fourth well developed. Interparietal plate twice as long as wide, considerably narrower than the parietals; both bounded posteriorly by some small plates. Loreal much longer than postnasal; no frenoörbital. Infralabials six on each side, the first pair in contact throughout. Dorsal scales coarse, round, projecting upwards at their posterior border. Brachial scales in six rows, antebrachials in three. One row of very large post-antebrachials, bounded by smaller ones. Femorals in eight rows, tibials in three. Femoral pores 16-18. Anal plates only three, separated from vent by a wide granular space, and surrounded anteriorly and laterally by one row of small flat

scales. Legs rather short, hind foot reaching to half way between humerus and auricular meatus.

Size above medium for the genus. Length of head and body to vent (tail injured) 110 mm.; length of head to angle of mandible, 26 mm.; do. to collar 34 mm.; do. to axilla 42 mm.; do. to fore leg 31 mm.; do. of fore foot 25 mm.; do. of posterior leg 71 mm.; do. of hind foot 35 mm.

Color above light olivaceous brown, transversed by seven longitudinal broad black stripes, three on each side and one on the middle line. On the lumbar region the median band disappears, and the pale intervals are wider than the black ones; anteriorly the pale ground assumes its normal relation of stripes on a black ground. The inferior commences at the orbit and passes over the tympanum; the next begins above the anterior border of the orbit and marks the external borders of the supra-orbital plates. The next issues from a parietal plate. Anteriorly the black interspaces have a few small spots; posteriorly they become undulate through lateral emarginations, and more posteriorly the first and second stripes are broken up into quadrate spots, the third remaining unbroken. The hind legs are very indistinctly marbled on an olive-gray ground. The fore legs are coarsely reticulated with black on an olive ground. The lateral dark stripes extend to the orbit, and there is a blackish shade on the side of the muzzle, just below the canthus rostralis. Lower surfaces everywhere yellowish, unspotted, except a few black specks on the inferior labials and sides of the gular region. Tail olive above, yellowish below.

This species belongs to the *C. sexlineatus* series, as indicated by the scales of its collar, but it has the coarse scales of the *C. tessellatus*. Its six infralabial scales are found only in the former series. Its coloration resembles in some degree the stage of the *C. tessellatus tessellatus*, called by Baird and Girard *C. tigris*, but it has seven stripes instead of four, and the lateral stripes are broken up and not the median, as is the case in the latter. It also differs from the latter in the marking of the fore leg, and nearly uniform coloration of the hind leg; the reverse being the case in the *C. tessellatus*. The striping of the head is also not seen in the latter. The head is also narrower in proportion to its length.

This, perhaps the handsomest species of the genus, is represented in the collection by an adult female only. It represents the *C. sexlineatus* in California.

Onemidophorus septemvittatus Cope.

<i>Catalogue Number.</i>	<i>Number Specimens.</i>	<i>Locality.</i>	<i>Whence obtained.</i>	<i>Nature of Specimen.</i>
2872	1	El Dorado Co., Cal.	Dr. C. C. Boyle.	Alcoholic.

CNEMIDOPHORUS SEXLINEATUS Linn.

Gray, Catal. Brit. Mus. Liz., 18, p. 21.

Dum. Bibron, Erp. Gen., V, p. 131.

Cope, Check List Batr. Rept. N. Amer., 1875.

Bocourt, Miss. Sci. Mex. Rept., 273, Pl. XXc, 11.

Boulenger, Catal. B. M., II, 1855, 364.

Lacerta sexlineata Linn., S. N., I, p. 364.

Amiva sexlineata Holbrook, N. Amer. Herp., 63, Pl. VI; 2d Ed., II, 109, Pl. XV.

Scales of collar large, in few rows, the largest at the border, larger than the median gular scales. Scales of body minute, .033 mm. in diameter. Large gular scales with abrupt posterior border extending entirely across throat. Four supra-orbitals. Frontoparietals large as parietals, truncate in front. Interparietals narrower than parietal, parallelogrammic. Labial scales five to below orbit; infralabials five or six, the anterior pair in contact throughout. Brachial scales in six to eight rows; antibrachials in three; femorals in from six to eight. Femoral pores 15-17. Anal plates three large ones; two posterior, one anterior. Longest toe of extended hind leg reaching to meatus auditorius.

The young have six longitudinal light stripes on a dark ground, which persist in adults; the dark interspaces being never marked by light spaces as in the *C. gularis*. The limbs are pale spotted on a darker ground and there is a longitudinal light stripe on the posterior face of the femur.

This is one of the smallest species, and it retains the young coloration everywhere. It is also distinguished by its short and high muzzle, and the absence of postantebrachial scales. It covers the Austroriparian region of the Nearctic realm and the eastern as far as the range of the Carolinian district, extending to Maryland and Delaware, but not New Jersey. In the Central region it reaches north to the Sand Hills of the Loup Fork river of Nebraska. Its southwest limit is in Texas.

Two specimens from Florida (one of them from Key West, No. 15,336) display the anomaly of a fusion of the three large anal plates into one. All other Florida specimens are normal.

CNEMIDOPHORUS GRAHAMII Bd. Gird.

Proceeds. Acad. Phila., 1852, p. 128.

Baird, U. S. Mexican Bound. Surv., II, 1859, p. 10, Pl. XXXII, Figs. 1-6.

Cope, Check List Batr. Rept. N. Amer., 1875, p. 45.

A distinct species which resembles in coloration the partly crossbanded forms of

the *C. tessellatus tessellatus*. But two specimens are known, and one of these has five and the other six infralabial plates. They are from Western Texas, between San Antonio and El Paso.

CNEMIDOPHORUS GULARIS Bd. Gird.

Proceeds. Acad. Phila., 1852, p. 128.

Baird, U. S. Mex. Boundary Survey, Reptiles, Pl. XXXIV, Figs. 1-6.

Cnemidophorus guttatus Hallowell, Proceeds. Acad. Phila., 1854, p. 192.

This species is allied to the *C. sexlineatus*, but is distinguished by the presence of postantebrachial plates, the more numerous femoral pores and the longer muzzle. It is very variable as to size and color, but the dark spaces between the light stripes are always marked, interrupted or completely broken up by light spots or spaces, except in the young. The color variations are similar to those already mentioned under the head of the *C. tessellatus* but they are more numerous. Specimens from Western Texas come nearest in character to the *C. sexlineatus*. It takes the place of that species throughout Mexico, also replacing the *C. tessellatus* in the drier parts of that country. Besides the characters already cited, this species differs from the *C. tessellatus* in its finer scales. These measure from .25 to .33 mm. in diameter, while those of the *C. tessellatus* measure .5 mm.; but this character does not always hold good.

The subspecies of the *Cnemidophorus gularis* differ as follows:

Stripes persistent, narrow, defined; no black spots; femoral scales in 6-8 rows; hind legs yellow spotted, and with a stripe behind; smaller.....*C. g. gularis*.

Stripes persistent, wide, ragged; spots in interspaces irregular; parietal plate very narrow; muzzle elongate; legs neither spotted nor striped; large; 8 rows femoral scales; 6 infralabials,

C. g. angusticeps.

Stripes vanishing, their interspaces with black crossbars ultimately joining crosswise; femoral scales 8-10; hind legs spotted; infralabials 5-6; large.....*C. g. mariarum*.

Stripes broken up into rows of spots; interspaces with yellow spots; hind legs with or without yellow spots; no posterior femoral stripe; a frenoörbital; 5-6 infralabials; large,

C. g. communis.

Light stripes traceable anteriorly only; black bands broken up into transverse spots by orange spots on body; hind limbs pale spotted; femoral scales 7-8 rows; infralabials generally 6; medium.....*C. g. scalaris*.

Anal plates 3-4; femorals in 8-9 rows; femoral pores 21; 6 infralabials; large scales of collar equal; stripes posteriorly obsolete; interspaces in front spotted; medium.....*C. g. sericeus*.

No light stripes; olivaceous with three rows of black spots on each side on anterior fourth of body; femorals 8; infralabials 6; muzzle elongate; limbs unspotted; medium,

C. g. semifasciatus.

No light stripes ; olivaceous with black bars on sides which cross back on lumbar region ; rump and hind legs yellow spotted ; femoral scales 8 rowed ; infralabials 6 ; muzzle elongate ; medium..... *C. g. costatus*.

The geographical distribution of the subspecies is as follows :

- C. g. gularis*, Sonoran region.
- C. g. angusticeps*, Yucatan.
- C. g. mariarum*, Tres Marias islands.
- C. g. communis*, S. W. Mexico.
- C. g. scalaris*, Chihuahua and southward.
- C. g. semifasciatus*, Coahuila, Mexico.
- C. g. costatus*, Mexico ; locality unknown.

These forms may be compared with those of the *C. tessellatus* in color characters as follows. I have already remarked* that this series of variations follows quite closely those pointed out by European authors to exist in the *Lacerta muralis*. These have been made the subjects of especial study by Prof. Eimer of Tübingen, from whose paper† I extract the following points of comparison (see Plate XII).

	<i>Onem. tessellatus.</i>	<i>Cnem. gularis.</i>	Other <i>Cnemidoph'i.</i>	<i>Lacerta muralis.</i>
1. Longitudinally striped.....	<i>C. t. perplexus.</i>		<i>C. octolineatus.</i> <i>C. sexlineatus.</i>	<i>L. m. campestris.</i>
2. Dark interspaces pale spotted.....	<i>C. t. tessellatus a.</i>	<i>C. g. gularis a.</i>	<i>C. labialis.</i>	
3. Dark interspaces divided by light color.....	<i>C. t. tessellatus β.</i>	<i>C. g. scalaris a.</i>	<i>C. septemvittatus.</i> <i>C. grahamii.</i>	<i>L. m. albiventris.</i> <i>L. m. striatamaculata.</i>
4. Dark spots confluent transversely, forming crossbars	<i>C. t. tessellatus γ.</i>	<i>C. g. scalaris β.</i>		<i>L. m. reticulata.</i>
5. Light spots not confluent ; light stripes broken up ; pattern reticulated	<i>C. t. melanostethus.</i>	<i>C. g. costatus.</i>	<i>C. variolosus.</i>	<i>L. m. tigris.</i> <i>L. m. punctulatofasciata.</i>
6. Dark spots separate and on a brown ground	<i>C. t. rubidus.</i>	<i>C. g. semifasciatus</i>		

There are some color forms in the *Lacerta muralis* which are not repeated in the North American *Cnemidophori*, particularly those which result in a strong contrast between the dorsal colors as a whole and the darker lateral colors, as a band. The color variety, No. 6, of the *Cnemidophori* is not reported by Eimer as occurring in the *Lacerta muralis*.

* American Naturalist, Dec., 1891.

† Archiv. f. Naturgeschichte, 1881, 239.

Cnemidophorus gularis gularis B. & G.

Cnemidophorus gularis Bd. Gird., Proceeds. Acad. Phila., 1852, p. 128.

Baird, U. S. Mex. Bound. Surv. Rept., Pl. XXXIV, Figs. 1-6.

Cnemidophorus guttatus Hallowell, Proceeds. Acad. Phila., 1854, p. 192.

This form resembles the *Sexlineatus* more than any other, but always possesses the postantebrachial plates, and more numerous femoral pores, which range from eighteen to twenty-two. Occasional specimens are, however, intermediate between the two. Its range is the Sonoran region.

Under this subspecies must be placed four of the series of forms which I described in my paper on the Reptilia of Chihuahua as subspecies of the *C. sexlineatus*,* in the following language; two of the forms (Nos. 5, 6) being the *C. g. scalaris* M.:

- "1. Six longitudinal narrow stripes with unspotted interspaces..... *C. g. gularis* (young).
- 2. Six stripes as above, the dark interspaces with small white spots..... *C. g. gularis verus*.
- 3. Six stripes as above, wider and very obscure; small obscure spots *C. g. gularis obsoletus*.
- 4. Six stripes as above, but wider, and the spots enlarged so as to be confluent occasionally with the light stripes.....

"Of the above forms all are numerously represented in the collection. The modification of the color pattern described, is not entirely due to age, as some of the largest specimens belong to Nos. 2 and 3. Nevertheless small specimens predominate in the No. 1, and No. 4 presents a good many small specimens." The specimens enumerated are as follows: †

Subspecies No. 1; Nos. 14,236-41-49-69; 14, 305.

Subspecies No. 2; 14,231-41,305-308.

Subspecies No. 3; 14,231-50-308.

Subspecies No. 4; 14,241-50-302-5.

These forms are not sexual, as several of them include both sexes.

Not having been fully persuaded of the distinction between the *C. tessellatus* and *C. sexlineatus* series, I used the name *C. s. tigris* for a "sixth subspecies" of the above table. The name was however misapplied, although the color pattern is identical with that of the *C. tessellatus tigris* B. & G., with the exception that there are traces of six stripes instead of only four. The smaller specimens referred to the *C. s. sexlineatus* differ from that subspecies in having well-developed postantebrachial scales.

The gradation in the color characters given is complete, so that no subdivision into subspecies can be made. The case is exactly parallel with that of *C. tessellatus*

*Proceeds. Amer. Philos. Soc., (1885) 1886, p. 233.

† The numbers are attached to lots, by the recorder, and not to individuals, and are hence sometimes duplicated.

tessellatus, except that there are here no individuals with the stripes entirely obliterated, and complete transverse stripes posteriorly. (Such specimens are the *C. g. scalaris*; see below.) The femoral pores are generally eighteen, but some have sixteen, seventeen and twenty. In eleven of the specimens now before me, seven have five infralabials, and four have six. These numbers do not coincide with the color types.

Cnemidophorus gularis angusticeps Cope.

Boulenger, Catal. Liz. Brit. Mus., II, 1885, p. 366.

Cnemidophorus angusticeps Cope, Proceeds. Amer. Philos. Soc., 1877, p. 95.

This large form is easily recognizable by its peculiar coloration, and by the very narrow parietal plate, which is about three times as long as wide. Four specimens are in the U. S. National Museum from Yucatan.

Cnemidophorus gularis mariarum Gthr.

Cnemidophorus mariarum Günth., Biologia Centr. Amer. Rept., p. 28, Pl. XX.

This also large form is distinguished from the other subspecies by the larger number of rows of its femoral plates, and by the coloration. In the young the dark spaces between the light stripes are crossbarred with black instead of a light color as in the other forms, and the result is crossbars on the sides in the adults, on the disappearance of the stripes. The hind legs are covered with large round yellow spots. The color pattern of this form corresponds with the *Lacerta muralis maculostriata* of Eimer.

Two specimens are in the U. S. National Museum, one from the Tres Marias islands, the typical locality, and the other of uncertain origin.

Cnemidophorus gularis communis Cope.

Cnemidophorus communis Cope, Proceeds. Amer. Philos. Soc., 1877, p. 95.

This subspecies reaches a larger size than any of the others of the *C. gularis*, and its peculiar coloration of small (or sometimes large) yellow spots on a dark olive ground, gives it a very distinct appearance. This form is identified with doubt with the *Cnemidophorus mexicanus* of Peters by Bocourt. What Peters' species is I have been unable to ascertain.

About forty specimens were sent to the National Museum from Colima, Western Mexico, by J. Xantus.

Cnemidophorus gularis scalaris Cope.

American Naturalist, 1891, p. 1135; (published March 1, 1892).

Cnemidophorus sexlineatus tigris "B. & G." Cope, Proceeds. Amer. Philos. Soc., 1886, p. 283; not *C. tigris* B. & G.

Muzzle moderately acuminate in adults; frenal plate about as high as long; frenoöcular plate generally wanting. Brachial scales small, in eight rows; antebrachials in three; postantebrachials in two or three rows. Femorals in eight rows. The three large anal plates are bounded by several small plates laterally and in front. Femoral pores nineteen; in one eighteen, and in one seventeen. Longest toe of extended posterior leg reaching to front of auricular meatus. First and fifth toes measuring opposite to each other.

Ground color pale, on the sides posteriorly light rosy orange. The dark color only remains as narrow transverse black stripes which do not cross the middle line, which is occupied by a longitudinal series of spots. This is due to the fact that in the adults the black ground is completely broken up by the transverse extensions of the light stripes, which are quite traceable in the young. In some specimens the black spots do not fuse on the sides into transverse stripes (No. 14,302). All the dark markings fade out on the limbs and sacral region, leaving a gray ground (in alcohol) which is marked with rosy orange spots. The lateral ventral plates and all those of the thorax with the posterior or concealed face of the anterior leg, are black or blackish in the adult.

Measurements of adult (tail injured): Length to vent 93 mm.; do. to angle of mandible 25 mm.; do. to collar 29 mm.; do. to axilla 26 mm. Length of anterior limb 30 mm.; do. of fore foot 14 mm. Length of hind limb 67 mm.; do. of hind foot 37 mm.

Several specimens of this form are contained in the collection, and they agree closely in all respects. In coloration it is perhaps the most ornamental of the genus. It is well distinguished from the *C. grahamii* in color characters, as well as in the presence of the well-developed postantebrachial scales. In the *C. gularis* it corresponds exactly in color characters with the *tigris* form of the *C. tessellatus tessellatus*, designated in the plate of colors (XII) as D and E.

Cnemidophorus gularis scalaris Cope.

Catalogue Number.	Number of Specimens.	Locality.	From whom obtained.	Nature of Specimen.
8,319	5	Mexican Plateau S. of Chihuahua.	J. Potts.	Alcoholic.
14,302	2	City of Chihuahua.	Edw. Wilkinson.	Alcoholic.

Cnemidophorus gularis sericeus Cope.

Scales of the collar moderate, subequal, in four or five rows, marginal scales equal to the others. Mesoptychial scales considerably smaller than the gular scales, which are large, and extend from one ramus to the other. Scales of the back rounded, not prominent, small, measuring .033 mm. Supraorbital plates wider than long except the anterior, and not separated from the frontoparietals by scales. Interparietal large, not twice as long as wide; parietals subtriangular, as wide as the interparietal, but much shorter. Frontoparietals remarkable for their small size, and from their terminating each in an angle anteriorly, which receive between them the posterior apex of the unusually narrowed frontal. They are smaller than the parietals, which are smaller than in other species. If these characters prove constant, I shall regard this form as a true species. Infralabial plates six on each side, the last one small; the first pair separated at the posterior angle. Brachial scales in six rows; antebrachials in four. Femorals in eight, tibials in three rows. Femoral pores twenty-one. The hind limb extended reaches the posterior border of the orbit.

Size medium. Length of head and body (tail injured) 81 mm.; length to angle of mandible 22 mm.; to edge of collar 26 mm.; to axilla 31 mm.; to fore limb 26 mm.; of fore foot 14 mm.; of hind leg 60 mm.; of hind foot 32 mm.

Ground color above anteriorly black, posteriorly olive. This is marked by six narrow lines of a paler olive, which represent the lines of the *C. sexlineatus*, with an additional median dorsal one. These fade out or become very indistinct on the lumbar and sacral regions. The interspaces black anteriorly, are marked at first by small olive spots, but these enlarging, break up the black ground into spots, but these fade out on the middle of the length. The superior surfaces of the limbs and tail are olive, the latter unspotted; the hind limbs faintly spotted with paler above and posteriorly, and the forearm reticulated with black posteriorly. The dorsal stripes, except the three median, extend as far as the orbit. Rest of head olivaceous. Lower surface of head, limbs and tail, yellow, the first named with a bluish transverse patch across the gular region.

This species has various peculiarities. It differs from the other members of the *C. gularis* series in the larger number and more equal size of the scales of the gular fold, approaching in this way the *C. tessellatus*, but not agreeing with it, since the marginal scales are not smaller. It differs from all the species in the small size of the interparietal and parietal plates. Its posterior legs are longer than in any species except the *C. variolosus*. No species has four rows (or three at the narrowest part) of

antebrachial scales; the usual number being 3-2; and the femorals are more numerous than in the *C. g. gularis*. The coloration is also quite distinctive. But one specimen is known, and that is from Southwestern Texas. The discovery of other specimens will determine whether this is or is not a true species. In the obsolescence of the color pattern posteriorly it resembles the *C. g. semifasciatus*, following.

Cnemidophorus gularis sericeus Cope.

<i>Catalogue Number.</i>	<i>Number of Specimens.</i>	<i>Locality.</i>	<i>Whence obtained.</i>	<i>Character of Specimen.</i>
15,650	1	San Diego, Tex.	Wm. Taylor.	Alcoholic.

Cnemidophorus gularis semifasciatus Cope.

Muzzle compressed, rather elongate; frenal with frenoöcular, longer than high. Large scales of the collar confined to the middle portion, smaller scales appearing on each side, and granules on the edge of the collar laterally. Posterior supraorbital small and divided on both sides, perhaps abnormally. Interparietals as wide as parietals, and extending farther posteriorly. Larger scales behind parietals few in number. Brachial scales in six, femorals in six rows. Postantebrachials in three or four rows. Femoral pores twenty. Dorsal scales minute. Anal plates three large ones with eight to ten smaller ones on the sides and in front. The hind leg a little short, the longest toe, when extended, not reaching the *meatus auditorius* by the diameter of the latter.

Total length 300 mm.; do. to angle of mandible 25 mm.; do. to collar 32 mm.; do. to axilla 42 mm.; do. to vent 100 mm. Length of fore limb 30 mm.; do. of fore foot 13 mm.; do. of hind leg 64 mm.; of hind foot 36 mm.

The color is uniform olivaceous above and below, with the following black marks: There are three rows of black spots on each side of the middle line above; the superior small, subquadrate, the second larger and transverse, the inferior forming short crossbars. The superior row extends from the interscapular region to the middle of the length of the back; the second row extends farther and the inferior row extends nearly to the groin. Limbs, head, belly and tail unspotted.

This form has various peculiarities which entitle it to be regarded as a subspecies, and possibly as a species. But two specimens are known to me. In No. 3033 the black spots are smaller, and are restricted to the anterior fourth of the length of

the body, being most distinct in front of the scapular region. Here traces of the original six stripes are visible between the spots.

It is possible that it may be demonstrated that the *C. sericeus* is established on a female of this species with abnormally reduced frontoparietal plates. The coloration is much like that of specimen No. 3033.

Cnemidophorus gularis semifasciatus Cope.

<i>Catalogue Number.</i>	<i>Number of Specimens.</i>	<i>Locality.</i>	<i>Whence derived.</i>	<i>Nature of Specimen.</i>
9248	1	Coahuila, Mex.	Lieut. Couch.	Alcoholic.
3033	1	Patos Coahuila.	Lieut. Couch.	Alcoholic.

Cnemidophorus gularis costatus Cope.

Cnemidophorus sexlineatus costatus Boulenger, Catal. Liz. Brit. Mus., II, 1885, p. 366.

Cnemidophorus costatus Cope, Proceeds. Amer. Philos. Soc., 1877, p. 95.

This form is totally distinct from all others in coloration. There are six infra-labials and eighteen femoral pores in the only known specimen. This is about the size of a large *C. s. gularis*, or less than the *C. s. angusticeps* and *communis*. Exact habitat unknown, but it is Mexican.

CNEMIDOPHORUS OCELLIFER Spix.

Peters, Monatsber. Akad. Wiss. Berlin, 1877, pp. 412-14.

Boulenger, Catal. Liz. Brit. Mus., II Ed., 1885, p. 372.

Tejus ocellifer Spix, Spec. Nov. Lacert. Braz., p. 23, Pl. XXV.

Cnemidophorus hygomii Rhdt. et Lützk., Vidensk. Meddel., 1861, p. 231.

Bocourt, Miss. Sci. Mex. Rept., Pl. XXc, Fig. 12.

Brazil.

CNEMIDOPHORUS MULTILINEATUS Philippi.

Archiv f. Naturgesch., 1869, p. 41.

Boulenger, Catal. Liz. Brit. Mus., 2d Ed., II, 1885, p. 373.

From Mendoza, Argentina.

Unknown to me by autopsy.

CNEMIDOPHORUS LABIALIS Stejneger.

Proceeds. U. S. Nat. Museum, XII, p. 643.

This is the smallest species of the genus, and is well characterized by its scutal peculiarities.

Cerros Id., coast of Lower California.

EXPLANATION OF PLATES.

Each plate includes the following figures: Superior, inferior and lateral aspects of head; superior view of arm and inferior view of forearm; inferior view of hind leg, with anal region; scales from side of body, with borders of ventral plates. The figures are natural size except

NOTE.—For the greater part of the material on which this paper is based, I am indebted to the U. S. National Museum, and its distinguished directors, Profs. S. P. Langley and G. Brown Goode.

Plate VI.

Fig. 1. *Cnemidophorus tessellatus perplexus* B. & G.; Specimen No. 3060 U. S. Nat. Museum.

Fig. 2. *Cnemidophorus tessellatus tessellatus* Say, α ; Spec. No. 3041 U. S. Nat. Museum.

Plate VII.

Fig. 3. *Cnemidophorus tessellatus tessellatus* Say, β ; No. 4113 U. S. Nat. Museum.

Fig. 4. *Cnemidophorus tessellatus tessellatus* Say, γ ; No. 3048 U. S. Nat. Museum.

Plate VIII.

Fig. 5. *Cnemidophorus tessellatus melanostethus* Cope; No. 3067 U. S. Nat. Museum.

Fig. 6. *Cnemidophorus variolosus* Cope; No. 3060 U. S. Nat. Museum.

Plate IX.

Fig. 7. *Cnemidophorus sexlineatus* Linn.; No. 4878 U. S. Nat. Museum.

Fig. 8. *Cnemidophorus septemvittatus* Cope; No. 2872 U. S. Nat. Museum.

Plate X.

Fig. 9. *Cnemidophorus gularis gularis* B. & G.; No. 3039 U. Nat. Museum.

Fig. 10. *Cnemidophorus gularis scalaris* Cope; No. 8319 U. S. Nat. Museum.

Plate XI.

Fig. 11. *Cnemidophorus scalaris sericeus* Cope ; No. 3066 U. S. Nat. Museum.

Fig. 12. *Cnemidophorus gularis semifasciatus* Cope ; No. 9248 U. S. Nat. Museum.

Plate XII.

Color variations of *Cnemidophorus tessellatus* and of *Cnemidophorus gularis*.

A. Young of *C. tessellatus* (*C. gracilis* B. & G.); No. 9270.

B. *C. tessellatus perplexus* B. & G.; No. 3060.

C. *C. tessellatus tessellatus* Say, β ; No. 3048.

D. *C. tessellatus tessellatus*, γ ; No. 4113.

E. *C. tessellatus tessellatus*, δ ; No. 3048.

F. *C. tessellatus rubidus* Cope; No. 15,149.

G. *C. gularis gularis*; young; No. 14,249; and adolescent (sp. from Rio Grande, Capt. Livermore).

H. *C. gularis gularis* B. & G.; adult; No. 3039.

I. *C. gularis scalaris* Cope, α ; No. 14,302.

K. *C. gularis scalaris* Cope, β ; No. 8319.

L. *C. gularis semifasciatus* Cope; No. 9248.

Plate XIII.

Color variations of *Lacerta muralis* copied from Eimer.

A. *Lacerta muralis*; young; from Karst.

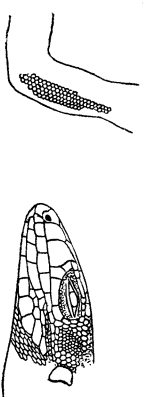
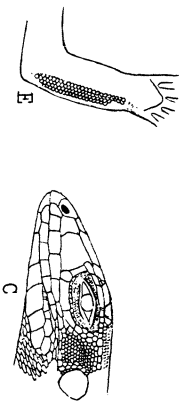
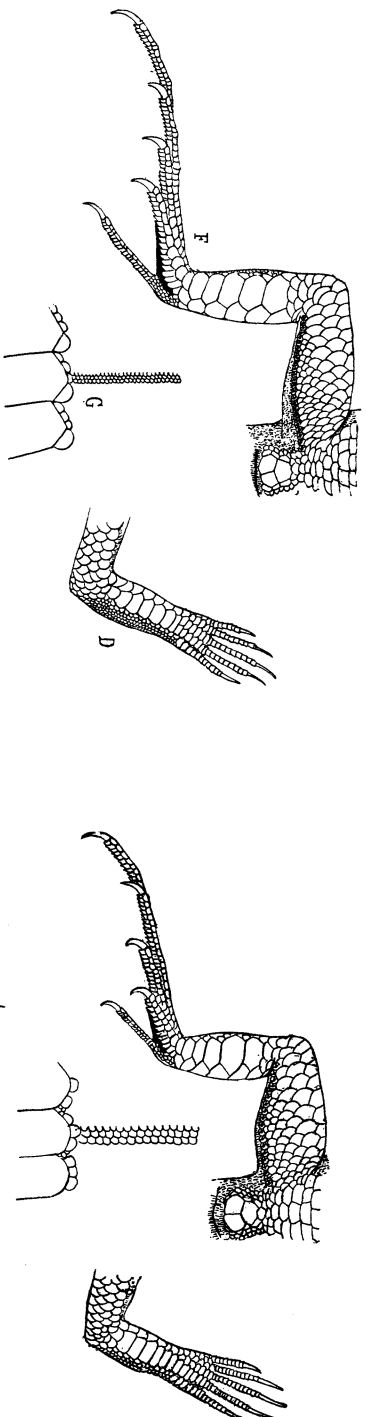
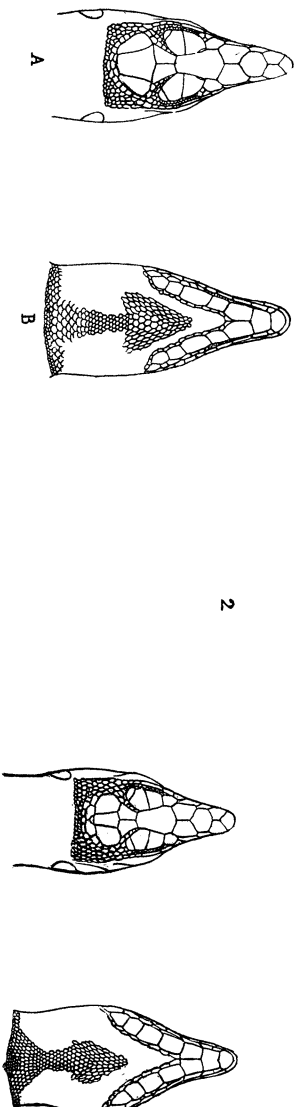
B. *L. m. campestris* De Betta.

C. *L. m. albiventris* Bonap.

D. *L. m. maculata* Eimer.

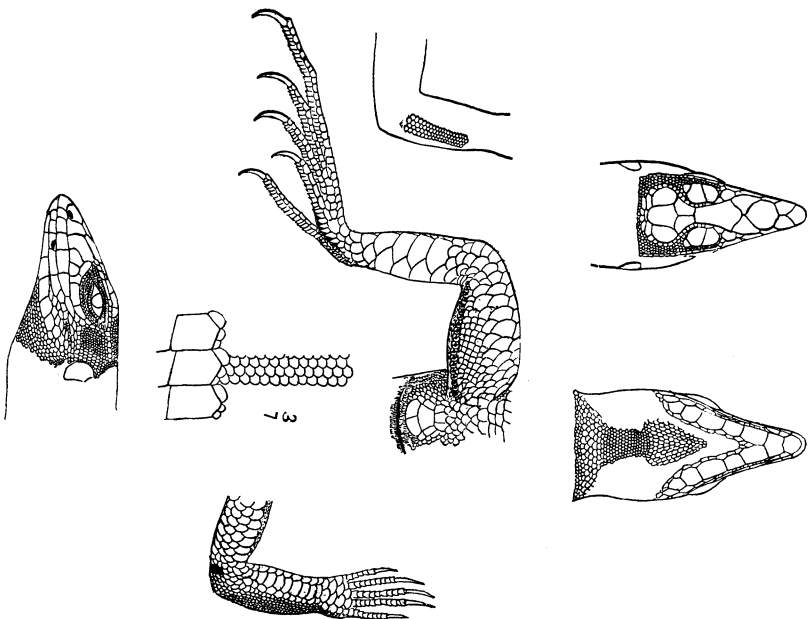
E. *L. m. tigris* (*reticulata*) Eimer.

2

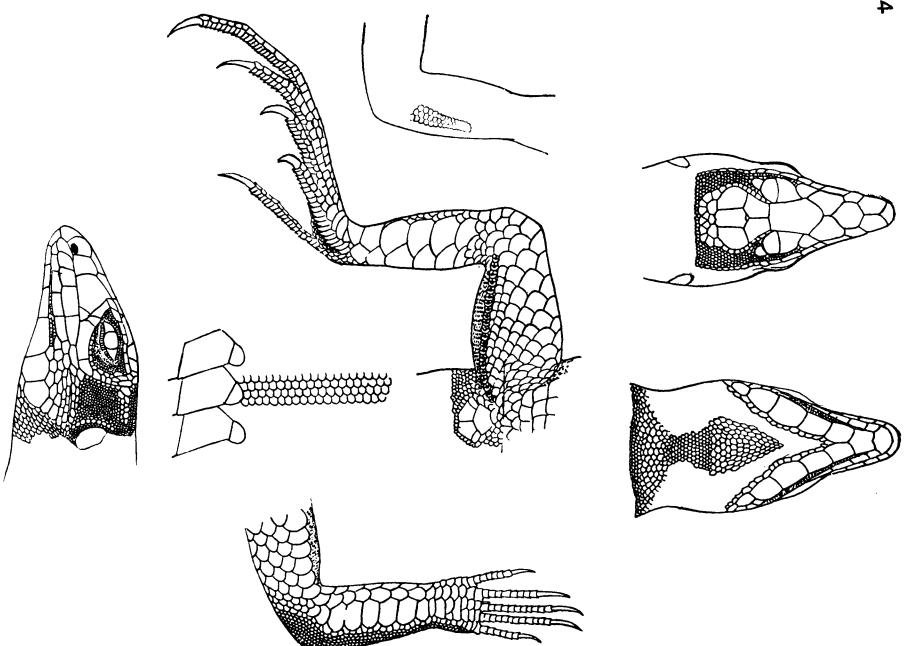


1, *Cnemidophorus tessellatus perplexus*. 2, *C. t. tessellatus* α .

3

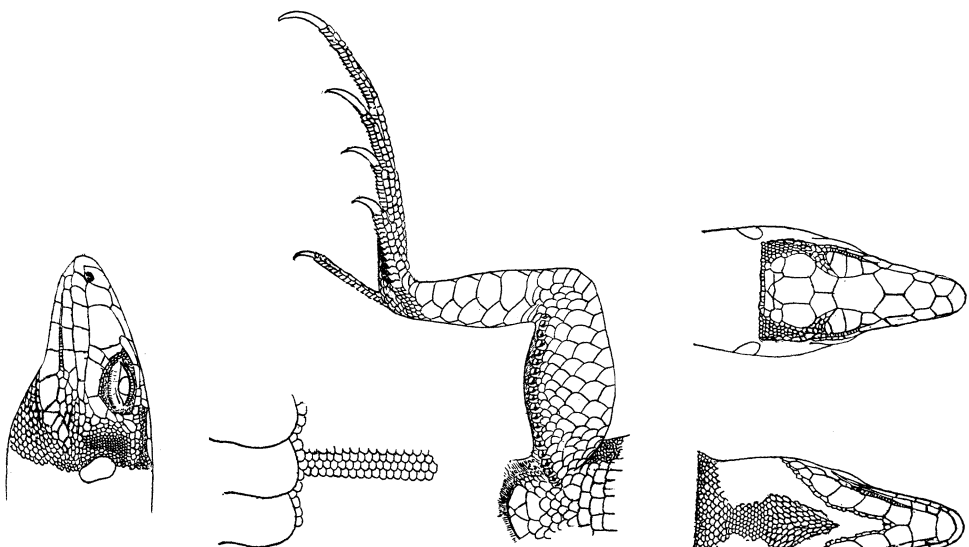


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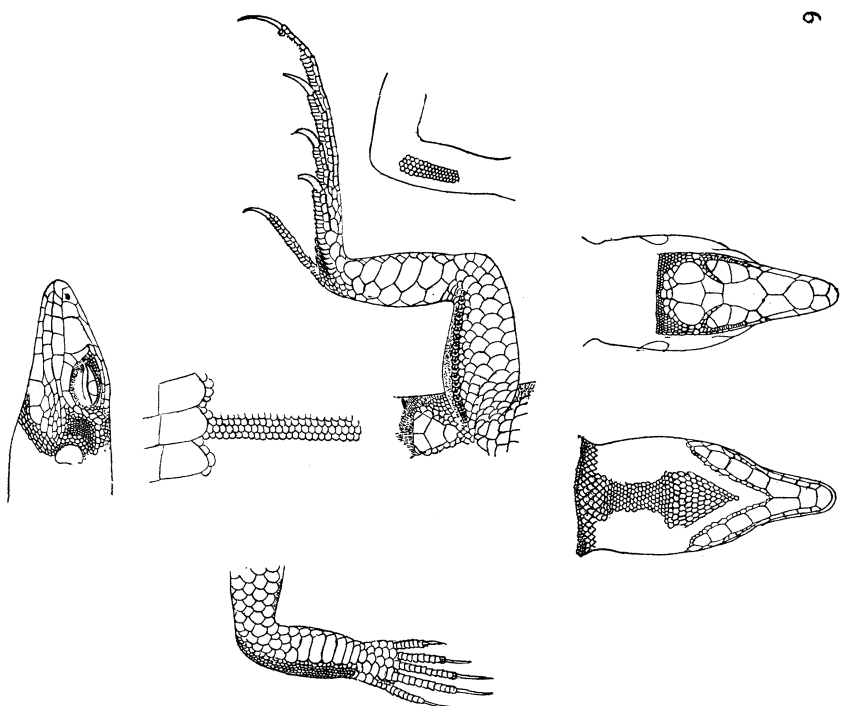


3, *Chnemidophorus tessellatus tessellatus* β . 4, *C. t. tessellatus* γ .

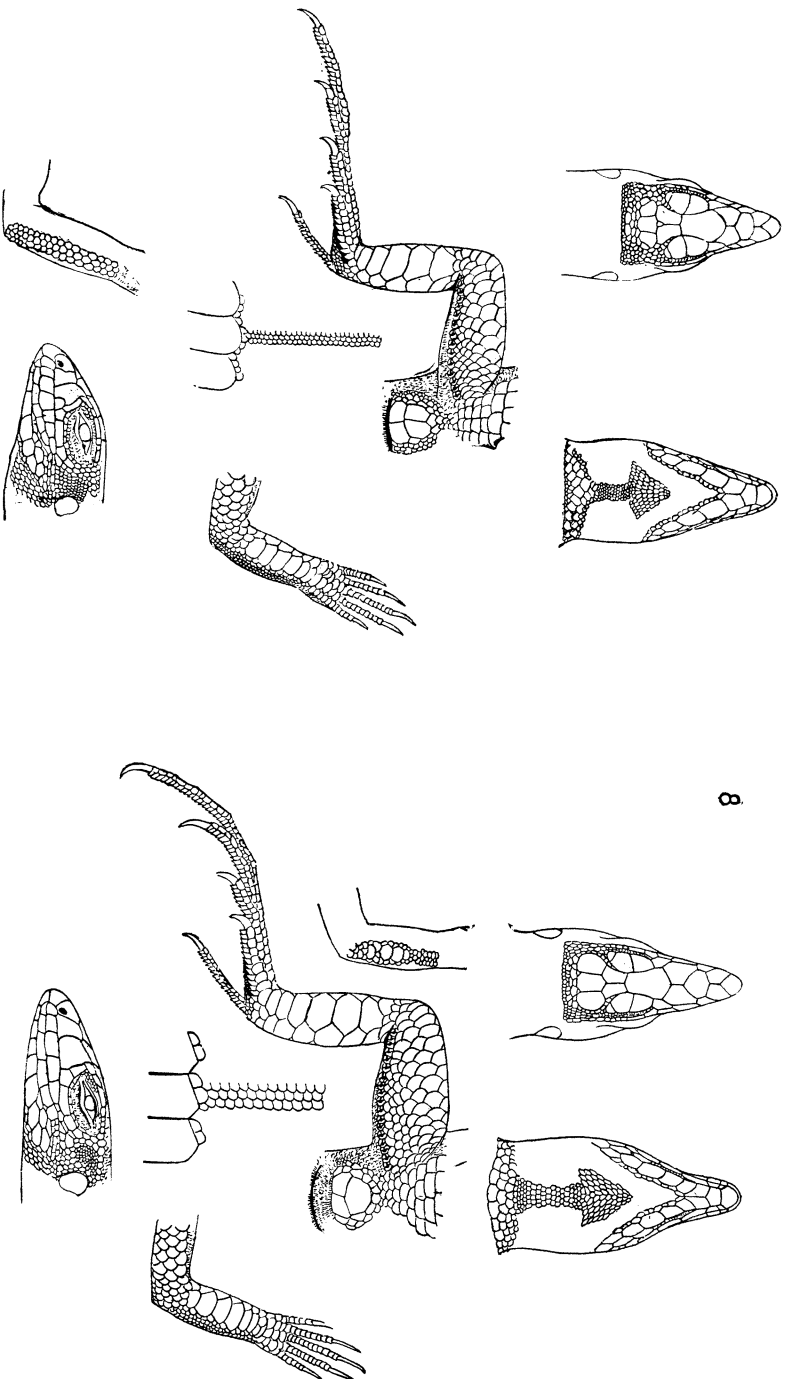
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6

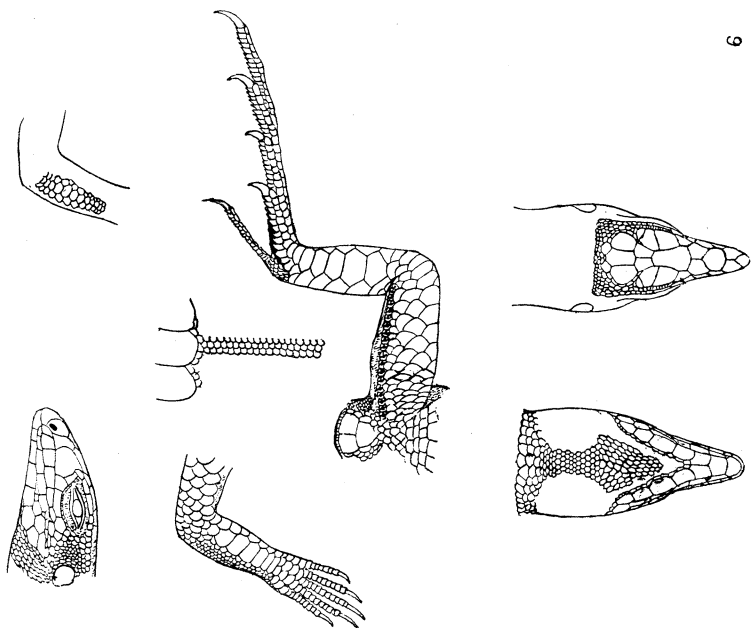


5, *Chemidophorus tessellatus melanostethus*. 6, *C. variolosus*.

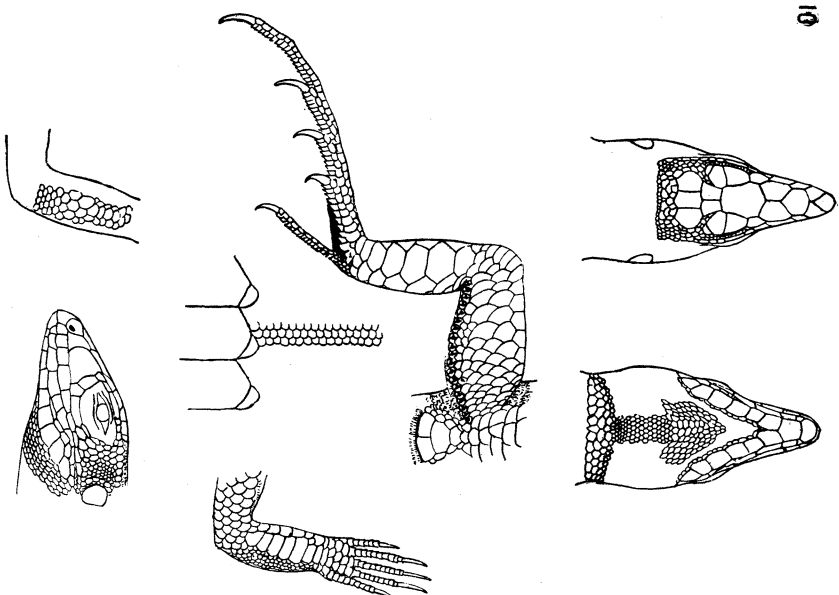


7, *Cnemidophorus sexlineatus*. 8, *C. septemvittatus*.

9

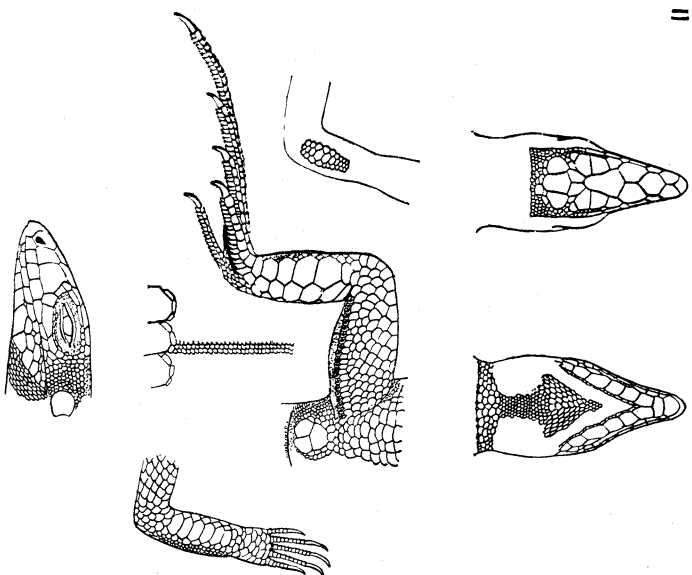


10

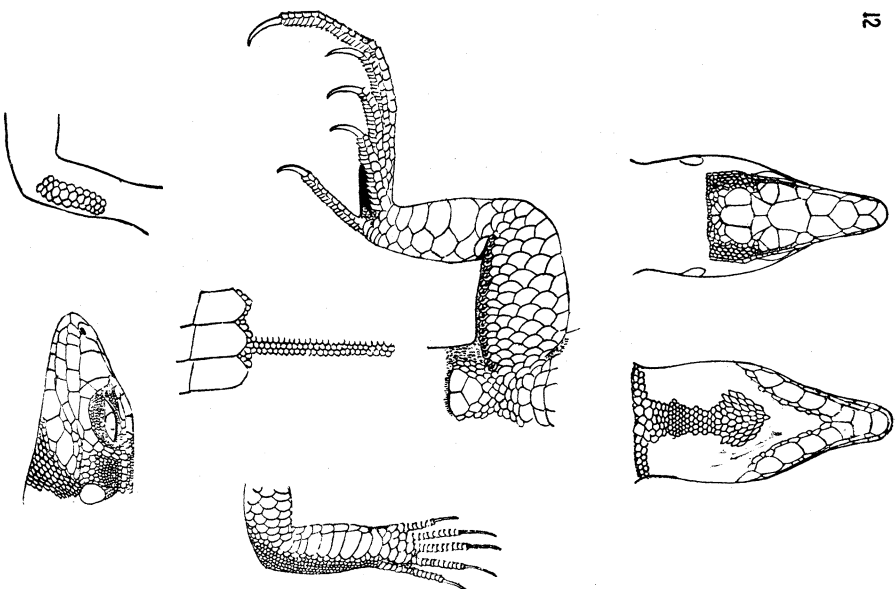


9, *Chamaeleo gularis gularis*. 10, *C. g. scalaris*.

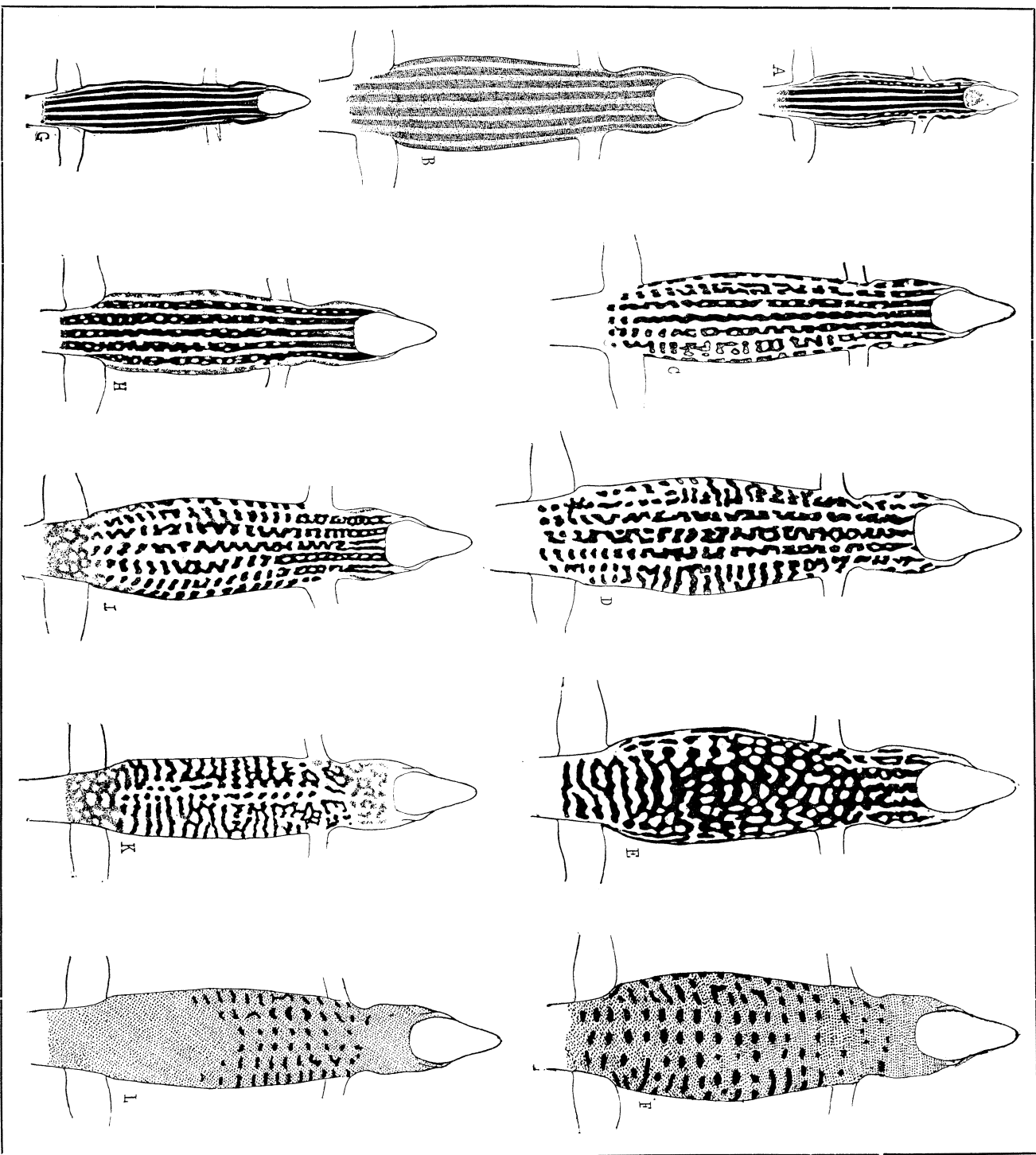
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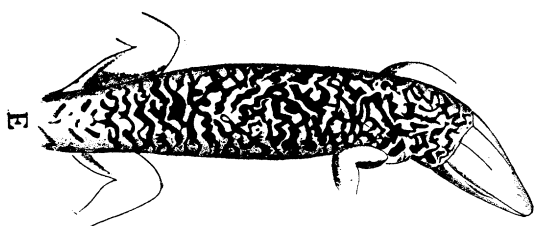
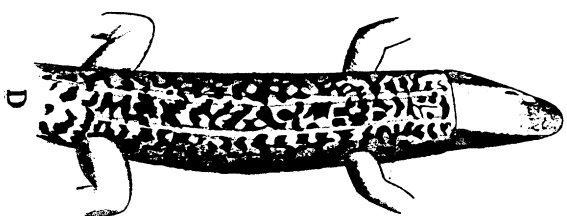
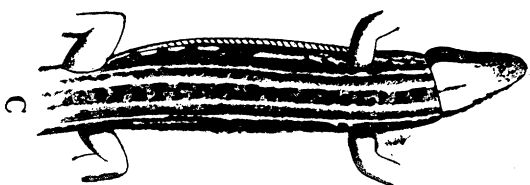
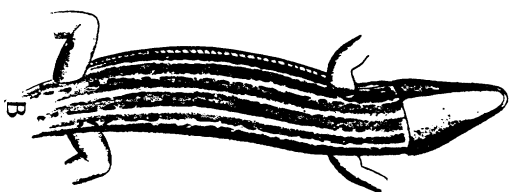
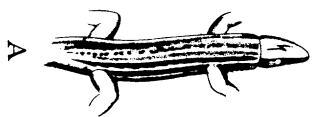
12



11, *Cnemidophorus gularis sericeus*. 12, *C. g. semifasciatus*.



A-E, *Cnemidophorus tessellatus*. G-L, *C. guttatus*.



A-E, *Lacerta muralis*.